Volume 3, Issue 1
Spring/Summer 2004

Feature Article:
Advanced Hydrologic Prediction System (AHPS) p. 2

National Weather Service Binghamton New York

The Nor'easter

From the Warning Coordination Meteorologist— *David Nicosia*

Changes at the National Weather Service Binghamton

After more than 10 years as Meteorologist-in-Charge (MIC) at the National Weather Service (NWS) in Binghamton, Peter Ahnert was promoted to Hydrologist-in-Charge (HIC) at the Middle Atlantic River Forecast Center (MARFC) in State College, PA. Peter not only is a meteorologist but also has extensive training and experience in hydrology and chose to pursue his interests in river forecasting as the leader of MARFC. MARFC has responsibility for providing river forecasts for the Susquehanna, Chemung, Delaware, James, Potomac, Raritan, Passaic, and Rappahannock River Basins. MARFC has responsibility for river forecasts for a large population including our nation's capital and other flood prone cities, like Harrisburg and Wilkes-Barre. Peter is missed by all and we wish him best of luck in his new position!

Peter's replacement, **Barbara Watson**, has taken over the reigns at NWS Binghamton as MIC. She comes to us from the NWS Baltimore-Washington D.C. office. Barbara was the Warning Coordination Meteorologist (WCM) there for over 10 years and has been one of the most innovative WCMs in our nation. She developed a severe weather safety guide for schools, which has been widely used in the United States and other countries. Barb represented the National Weather Service at the World Meteorological Organization in Geneva, Switzerland and recently was part of a panel discussion on hurricanes at the Bahama's Weather Conference. Barb was instrumental in producing a winter storm safety brochure which is now in wide use across the United States. She has conducted over 100 tornado storm surveys and has even met President Bush. She was privileged to give the President a demonstration of the National Weather Service's new computer system!

Barb brings a tremendous amount of experience and knowledge to our office. In the 1980s, she worked in Alaska so she is no stranger to snow and cold! After her stint in Alaska, she worked in New Mexico before transferring to the Washington office where she resided until taking the MIC position in our office.

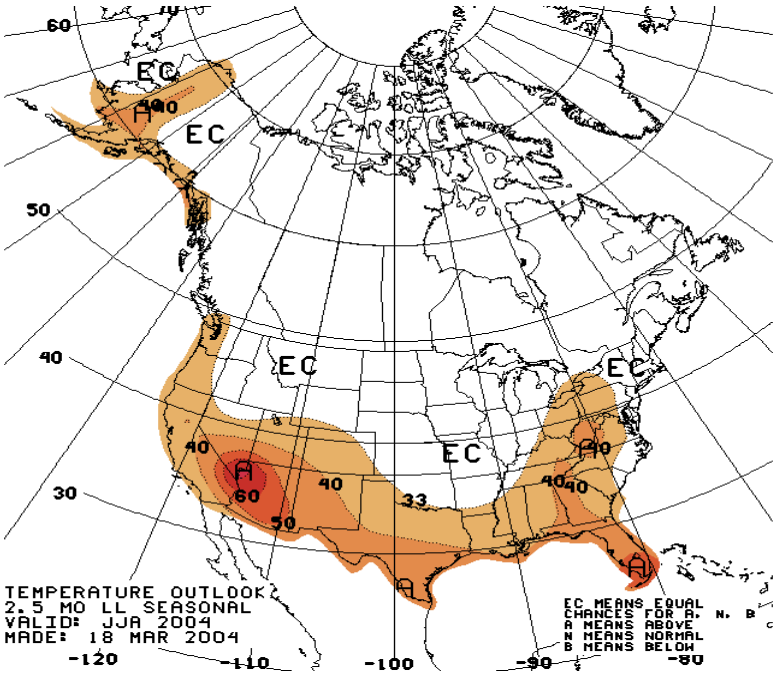
We are looking forward to working for her and she is thrilled to be stationed in Binghamton.

Continued on page 5

Inside this issue

What can we expect this Summer?

The official summer outlook for temperature and precipitation has been released by the National Weather Service's Climate Prediction Center. There is an equal chance of temperatures and precipitation to be above normal, near normal, or below normal. For central New York and northeast Pennsylvania, the average high temperatures during the height of summer ranges from the middle to upper 70s over the higher elevations, to the lower 80s in the valleys. Nighttime lows range from the middle 50s to lower 60s. Most precipitation in the summer comes from thunderstorms. The average rainfall for the summer months (June-July-August) is generally between 10 to 12 inches.



Last year's excess of precipitation, even with below normal precipitation so far this year, points to a decreased threat of drought. All drought indices and soil moisture show near normal to wet conditions.

Theodore Champney
Meteorologist

AHPS—A New Look at Our Rivers

The National Weather Service is implementing a new program called AHPS, Advanced Hydrologic Prediction Services. The goal of the AHPS program is to provide NOAA's customers with more accurate and informative hydrologic products along with longer lead times for flood watches and warnings. These AHPS products are designed to take advantage of advances in science and technology and to incorporate probabilistic information to describe the uncertainty associated with a forecast. The AHPS products are primarily graphical and are accessible via the Internet.

MARFC is one of 13 River Forecasts Centers throughout the United States and provides hydrologic support to seven NWS offices in the Eastern Region of the NWS. The MARFC supports the Binghamton (BGM) NWS office by providing both routine river and flood forecasts for the Susquehanna River in New York State, down to Wilkes-Barre in Pennsylvania, and also for the Delaware River from its headwaters down to Montague, New Jersey.

MARFC has completed several key steps in order to generate AHPS type forecasts for the BGM area including: (1) calibrating 63 basins in the Susquehanna watershed and 32 basins in the Delaware/ Lehigh/Schuylkill watersheds with a complete hydrologic computer model capable of simulating surface runoff, baseflow, snow accumulation and melting, evapotranspiration, basin and

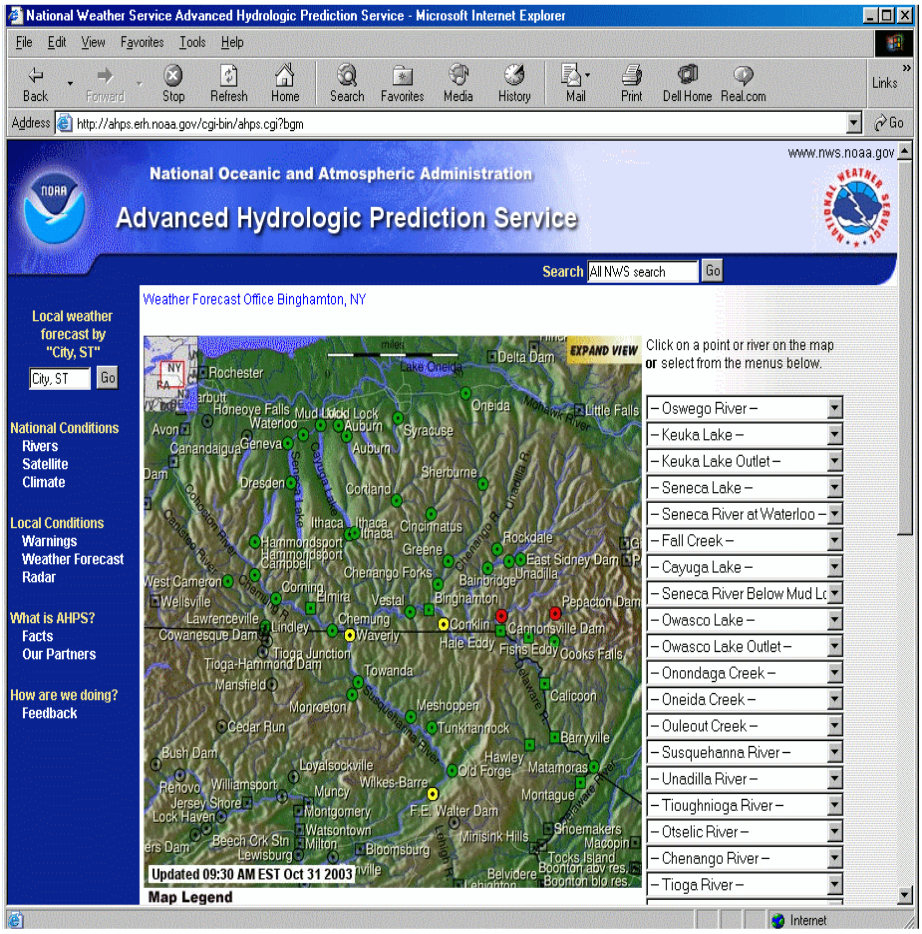
(Continued on page 3)

Rivers…continued from page 2

channel routings and reservoir operations, (2) obtaining sufficiently powerful workstations and installing NWS-supplied software (ESP/ESPADP) to generate and analyze probabilistic forecasts and, (3) automating a process to generate the forecasts and graphics and display the graphics via the AHPS web site. All of this work has now been completed for the Susquehanna and Delaware River Basins and "Basic" AHPS products are now generated on a weekly basis.

The fundamental tool used to generate the probabilistic forecasts is ESP, Ensemble StreamFlow Prediction. The ESP system enables hydrologists to make longer-range probabilistic streamflow forecasts based on the current basin hydrologic conditions (soil wetness, river and reservoir levels, subsurface flow, and extent and condition of any snowpack) along with 50 years of historic temperature and precipitation data. ESP assumes that each year of historical meteorological data is a possible representation of weather that may occur in the future. ESP generates one streamflow trace for each year of historic data with each model run initiated to the current basin conditions. These traces are called the conditional simulations (CS). In contrast, the model can be run for the 50-year time period and NOT be reset to the current basin conditions which is an attempt to recreate the historic streamflows. These traces are called historical simulations (HS) and should be similar to the observed historic flow data. The ESPADP software is used to generate probabilistic forecasts for the flow variable of interest (e.g., maximum flow/stage, minimum flow/stage, mean daily flow volumes) over the time period of interest.

MARFC currently generates 30-day forecasts for the Delaware Basin each Wednesday and 30-day forecasts for the Susquehanna Basin on Fridays. These forecasts are available via the WFO BGM website (www.erh.noaa.gov/er/bgm) or MARFC website (www.erh.noaa.gov/er/marfc), click on AHPS, and click on the area of interest in the map for a more detailed view. Below is the WFO BGM AHPS web page.



Note the circle for Wilkes-Barre river gage is yellow. The yellow color indicates the Susquehanna River is high, and in this instance above the cautionary stage of 10 feet at Wilkes-Barre. A green circle indicates that a river is below critical levels and a red circle indicates river flooding or that a reservoir is spilling. Clicking on the yellow circle for Wilkes-Barre brings up a standardized web display including the most recent observed river levels (blue dots) and forecast stages (green dots). This page is often referred to as the

(Continued on page 16)

A Look Back at the Winter of 2003-2004

Temperature:

The winter of 2003-2004 was cold overall, but varied quite a bit from beginning to end. December was slightly warmer than normal, while February was slightly colder than normal. In between, central New York and northeast Pennsylvania experienced one of the coldest Januarys' in the past 50 years. Historically, January 2004 was the 2nd coldest in Binghamton and Syracuse, and tied for 3rd coldest in Scranton/Wilkes-Barre (Avoca). The fact that January turned out that cold is impressive considering the first five days of January were well above normal. If those mild first five days are ignored, it turns out that the January 6th-31st timeframe was the coldest on record in Binghamton and Syracuse, and the 2nd coldest in Avoca.

	Binghamton (54 yrs of record)	Syracuse (56 yrs of record)	Scranton/ W-B (Avoca) (50 yrs of record)
Winter 2003-2004 Temp (°F)	**21.3**	**22.4**	**25.2**
Rank	12th Coldest	8th Coldest	14th Coldest
December Temp (°F)	**28.3**	**30.0**	**31.5**
Rank	23rd Warmest	28th Warmest	23rd Warmest
January Temp (°F)	**13.4**	**14.7**	**18.7**
Rank	2nd Coldest 1st – 1977 (12.0°)	2nd Coldest 1st – 1994 (12.6°)	3rd Coldest 1st – 1977 (15.0°)
February Temp (°F)	**22.4**	**22.4**	**25.5**
Rank	21st Coldest	19th Coldest	17th Coldest
January 6th-31st Temp (°F)	**9.2**	**10.3**	**14.7**
Rank	Coldest 2nd – 1977 (10.9°)	Coldest 2nd – 1994 (11.2°)	2nd Coldest 1st – 1977 (14.2°)

Snowfall: (no data for Avoca)

December and January were very snowy months, while snowfall in February was slightly below normal. Overall, the December 2003-February 2004 timeframe was the snowiest ever in Syracuse and the 5th snowiest in Binghamton. The winter of 2003-2004 didn't see any "superstorms" in terms of accumulation, but the region did see 4 moderate snowstorms. Below is a table of snowfall statistics from the winter of 2003-2004.

	Binghamton	Syracuse
Winter 2003-2004 Snowfall (inches)	**83.8**	**146.0**
Rank	5th	1st
December Snowfall (inches)	**32.9**	**48.5**
Rank	4th	5th
January Snowfall (inches)	**36.3**	**78.1**
Rank	5th (tie)	1st (snowiest month ever)
February Snowfall (inches)	**14.6**	**19.4**
Rank	26th snowiest	18th least snowy

Winter Summary continued...

Table of December 2003 – February 2004 Snowstorms

	General Amounts	Maximum amounts
December 5th-6th	5”-10”	10”-15” over western Catskills and Pocono’s
December 14th-15th	6”-12”	15”-18” over northern Onondaga & Oneida counties
January 27th-28th	4”-8”	8”-10” over western Catskills
February 3rd	4”-8”	Isolated 10” amounts

Maps of these and other storms can been viewed at the following Internet address: http://weather..gov/bgm/recentwx/

Jon Van Ausdall
Meteorologist

WCM continued...

Of the 122 National Weather Service Offices nationwide, Binghamton was her first choice! We are lucky to have a person of such talent at our office. She is looking forward to meeting and serving you, the customers and partners in our area.

Another change that has taken place at Binghamton is the retirement of our long time Electronic Systems Analyst (ESA), Lenard Johnson. Len was the ESA here for over 10 years, and enjoyed a 30 year career with the Federal Government and the Military. As ESA, Len was responsible for transitioning our office into the modernized AWIPs era. Len still resides in the Binghamton area with his wife, Betty.

Len’s replacement, **Ron Quillen** comes to us from the NWS Training Center in Kansas City, Missouri. Ron is a nationwide expert on the NOAA weather radio computer system and previously trained other electronic technicians and ESAs on this system. Ron is extremely dedicated to the mission of the NWS.

He has been known to be in the office during the wee hours of the morning to repair equipment so that our forecasters can still provide forecasts and warnings for the public. Ron exemplifies the phrase “service above self”.

During his first weekend at our office, he worked almost 20 straight hours ensuring that critical equipment was up and running. His hard work, and long hours brought 3 automated weather stations and a NOAA weather radio station back online prior to a major winter storm. Ron is an key asset to our office and we look forward to working with him in the coming years.

It is the hard work, dedication and experience of people like Barb and Ron that make NWS Binghamton such a great place to work!

David Nicosia, Warning Coordination Meteorologist

Heat Waves: Summer's Scourge

After a long, cold and snowy winter, many of us are looking forward to a warm summer day with sunshine and the plethora of outdoor activities that goes along with summer. Most of the time our summers bring pleasantly warm weather with average afternoon high temperatures ranging from the mid to upper 70s on the hills and mountains, to the low 80s in our valleys. Nighttime lows average from the mid 50s to lower 60s. The humidity is usually only moderately high and remains comfortable for most. Our area has some of the most pleasant summer weather in the United States. However, once in a while, our area can experience excessive heat and humidity, with daytime highs in the 90s or even topping 100 with lows dropping no lower than 70. In addition, the air becomes hazy, very humid and uncomfortable to most people. Sometimes, conditions can become dangerous to those who are vulnerable to heat like the elderly, sick and very young. Excessive heat and humidity lasting at least 2 days is what meteorologists call a "heat wave".

Hot Weather Safety Tips:

- **Slow down.**
- **Dress Light.**
- **Eat Less.**
- **Drink plenty of water.**
- **Do not drink alcoholic beverages.**
- **Do not take salt tablets**
- **Air Conditioning.**
- **Limit Sun Exposure.**

What causes a heat wave? Heat waves are caused when the jet stream lifts well north into Canada and our region comes under the influence of a large upper level atmospheric high pressure system. The high pressure system aloft can become stationary and block cold fronts from dropping south from Canada. Underneath these high pressure systems, the air is sinking, compressing and warming. Often the skies remain clear as the air warms under abundant sunshine. As the air mass becomes warm and nearly stationary it picks up more and more moisture, often from the Gulf of Mexico or the Atlantic Ocean. The longer these upper level highs persist, the more oppressive the air mass can become. Sometimes, the air becomes so hot and humid that it can become downright dangerous to all, even healthy people.

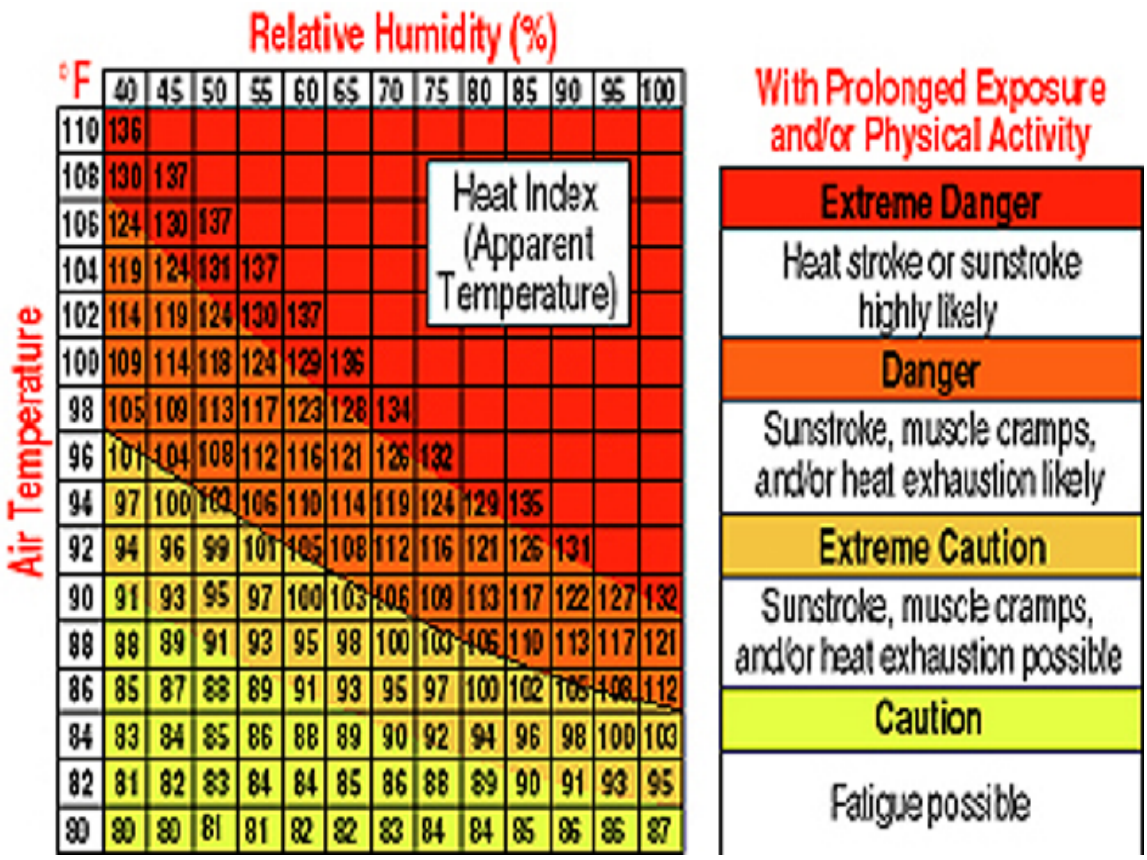
The National Weather Service measures the combined effect of heat and humidity in an index called the **heat index**. The heat index is an estimate of how it feels outside when the humidity levels are combined with the temperatures much the same way that wind chill measures the combined effect of wind and cold.

The National Weather Service will issue a **Heat Advisory** when the Heat Index is expected to be between 105F and 115F degrees for less than 3 hours in a day and for nighttime low temperatures greater than 75F for 2 consecutive days. An **Excessive Heat Warning** will be issued when the heat index is expected to be greater than 105F for more than 3 hours for 2 consecutive days OR a heat index value greater than 115F at any time.

Heat is stressful to the human body and it is important to know some of the signs of a heat-related illness. The following is some information on heat related illnesses:

SUNBURN Redness and pain. In severe cases swelling of skin, blisters, fever, headaches. Ointments for mild cases if blisters appear and do not break. If breaking occurs, apply dry sterile dressing. Serious, extensive cases should be seen by physician.

HEAT CRAMPS
Painful spasms usually in muscles of legs and abdomen possible. Heavy sweating. Firm pressure on cramping muscles, or gentle massage to relieve spasm. Give sips of water. If nausea occurs, discontinue use.



HEAT EXHAUSTION
Heavy sweating, weakness, skin cold, pale and clammy. Pulse thready. Normal temperature possible. Fainting and vomiting. Get victim out of sun. Lay down and loosen clothing. Apply cool, wet cloths. Fan or move victim to air conditioned room. Sips of water. If nausea occurs, discontinue use. If vomiting continues, seek immediate medical attention.

HEAT STROKE (or sunstroke)
High body temperature (106° F. or higher). Hot dry skin. Rapid and strong pulse. Possible unconsciousness. **HEAT STROKE IS A SEVERE MEDICAL EMERGENCY. SUMMON EMERGENCY MEDICAL ASSISTANCE IMMEDIATELY! DELAY CAN BE FATAL.** While waiting for emergency medical help to arrive, move the victim to a cooler environment. Reduce body temperature with cold bath or sponging. Use extreme caution. Remove clothing, use fans and air conditioners. If temperature rises again, repeat process. Do not give fluids.

Dave Nicosia, Warning Coordination Meteorologist

NOAA Weather Radio: More Specific Information and Better Clarity

The last year has seen several changes to NOAA Weather Radio. First one of the computer voices received a major upgrade. The new voice, "Tom," represents a big advancement over the previous 2 male voices, "Arnie" and "Craig." The Tom voice offers far better clarity and voice pacing than its predecessors.

Secondly we implemented warning tones for Winter Storm Warnings and High Wind Warnings, as part of an experimental program. Warning tones are emitted for these hazards at all hours except very late at night and early in the morning. It is hoped this program of emitting warning tones for Winter Storm Warnings and High Wind Warnings will help save lives and property by alerting the public when these hazards become imminent.

Lastly, with the NOAA Weather Radio network in Upstate New York and Northeast Pennsylvania at an all-time high of 12 transmitters, we are now able to offer more specific information on each local transmitter. This means if you live in Bath, NY or Cooperstown, you will hear weather information which is increasingly specific to your locality. More specific warnings, watches, and forecast products are now available to our entire NOAA Weather Radio network.

For a complete list of NOAA Weather Radio transmitters in Upstate New York and Northeast Pennsylvania, see the last page in this newsletter.

Daniel Padavona, Meteorologist
NOAA Weather Radio Program Leader

A Severe Weather "Day in the Life" at the Binghamton NWS

The severe weather season has arrived in New York and Pennsylvania. This is the SkyWarn spotter's most active time, and during severe weather, the National Weather Service (NWS) in Binghamton (BGM) is also an extremely active place. So, what goes on at the NWS BGM during a severe weather event? And, how do spotter reports fit into the picture?

Planning for severe weather begins 24-48 hours prior to the event. NWS meteorologists are always alert for clues to possible severe weather. Frequently, computer models, and an understanding of the atmosphere, allow us to spot the ingredients for severe weather development a day or two in advance. If severe weather is anticipated for the following day, the lead forecaster will arrange for additional staffing, and may issue a Severe Weather Outlook, depending on the expected severity of the storms, and the confidence level of the forecast. The Storm Prediction Center (SPC) in Norman, Oklahoma, also issues Convective Outlooks up to 3 days in advance. These outlooks outline possible areas where severe weather may occur, as well as areas of general thunderstorm development.

(Continued on page 9)

On the day of the anticipated severe weather, forecasters on the midnight shift will begin to address the severe weather threat. They may include the possibility of severe storms in the zone forecast and the National Digital Forecast Database (NDFD), or may issue or update the Severe Weather Outlook. Also, they will issue the daily Hazardous Weather Outlook, to alert Emergency Managers, SkyWarn Coordinators, and others to the severe weather potential.

As the day goes on, the forecasters monitor the weather for signs of storm development. They use satellite, radar, surface, and upper air observations to look for areas of potential severe storm development. If conditions are favorable for severe storms, the SPC will issue a watch.

When a watch is issued, the NWS in BGM goes into "severe weather mode." First, the watch must be sent to the public, including via NOAA Weather Radio (NWR). Next, the Hazardous Weather Outlook, will be updated to alert Emergency Managers, SkyWarn coordinators, and SkyWarn spotters.

Once the watch is "on the street", the focus shifts to monitoring the weather situation, and issuing warnings, if necessary. Usually, there will be 5 to 7 forecasters on duty in the BGM office during severe weather. All but two of them (responsible for keeping our routine forecasts current) will have specific severe weather responsibilities. One person will act as "coordinator", making sure warnings are properly issued, keeping track of the status of the warnings and watching the "big picture". Another person will continuously monitor the radar and make warning decisions. And, still another person will prepare and issue the warnings when they are needed. Last, but certainly not least, one or two people will be responsible for securing ground truth, and answering the phones.

Ground truth is just that, the truth of what's happening on the ground. All of the technology we use can give us a good idea of what's going on, but we're in Binghamton, we can't know for sure what's happening in Utica, NY or Scranton, PA. That's why spotters are so important. We do issue many warnings based on the information we have here at the office, but we can issue a more precise warning, with a higher level of confidence, if we have a spotter report. Once we decide to issue a warning, we act quickly. We have a software package called WarnGen, short for Warning Generation. WarnGen allows us to quickly plot the path of the storm as an overlay on the radar image. WarnGen will then determine the future path of the storm based on its previous movement. With the click of a button, we can then generate the warning text, including: the storm's current location and movement, the projected path, and specific threats posed by this storm. The warning process, from warning decision until the alert tones are sent over NWR, takes around a minute. Generally, a Severe Weather Statement will be issued to update or cancel current warnings. Also, any spotter information on the edge of our county warning area will be relayed to the appropriate adjacent NWS office, where it will be used in warning decisions for that office. During the course of the

"At the National Weather Service forecast office, planning for severe weather begins 24 to 48 hours prior to the event"

(Continued on page 12)

Spotter News

The big news on the SKYWARN front here at the National Weather Service (NWS) in Binghamton is the new tower on the hill behind the office. New construction here at the Binghamton Regional Airport resulted in two more significant beam blockages for our two-meter operations. This necessitated purchase and erection of a new tower.

This project has been a cooperative effort between the NWS, Broome County, and Binghamton area hams, especially Ford Drake (AB2HS). When notified of the difficulty the new water tower and maintenance building would cause, the county and airport offered a site for a new tower. They also did some site preparation and poured the massive concrete base for the tower. The NWS provided the tower, cabling, rotor and paid to have the tower constructed and the cables pulled through the conduit. Ford's group provided the beam antenna and most importantly, Ford offered expert advice on needed components. Ford also has helped with prep work on the rotor including designing the mounting hardware and has installed the coax connectors.

Now that the weather has turned a bit more pleasant, the NWS will soon rent an 80-foot lift and your intrepid reporter and SKYWARN coordinator will install the rotor, beam and secure the cabling using his skills learned after attending two separate tower climbing and rescue classes in Kansas City. After that, we should be good to go!

If we have time we hope to remove the old ailing rotor and beam from the original 65-foot tower behind the office. The old rotor still moves the beam, but it's impossible tell which direction it's pointing without looking out the window! We plan to install standard omni-directional antenna in the old beam's place.

Weather-wise, it's been an active spring so far. During the afternoon of Sunday, April 18th, a line of severe thunderstorms ripped across central New York spawning a small tornado in Cayuga County. The last few years have seen few severe outbreaks resulting in area-wide SKYWARN activations. The beginning of this severe weather season may be a sign of things to come. We certainly are overdue for an active year!

Remember the basics: If a severe thunderstorm or tornado warning is issued for your county, SKYWARN is automatically activated. Tune your 2-meter rig to the proper frequency pair and check into the net. If you can, start the net yourself. Severe reports should be collected and forwarded to the NWS via the radio using the proper repeaters. If you can't get through to an operator here at Binghamton, use the 800 number to get your reports to us. If you have questions regarding your county's net procedures, contact your ARES EC or their designate for information.

We will try to give you advance warning and ask to get your net set up before the warnings are issued, but that's not always possible so be prepared to go if the forecast for the day include the possibility of severe weather.

Well, that's it for now. Enjoy the warmer weather and stay safe.

73,
Dave Morford KB2TTT

Lightning: The Underrated Killer

Each year, approximately 400 people in the United States are struck by lightning, and more than 80 of them are killed. This is more people killed per year than by tornadoes! In addition to fatalities, several hundred others become permanently disabled from lightning strike injuries. With summer just around the corner, it is a good time to refresh our understanding of thunderstorms and lightning. Remember, ALL thunderstorms produce lightning, so there's a good chance that sometime this summer we will need to put some of the following safety tips in to action.

Lightning Safety Rules

Postpone outdoor activities at the first sign of lightning or the sound of thunder. This is your best way to avoid being caught in a dangerous situation. It does not have to be raining, or in some cases even cloudy to be struck by lightning! Lightning strikes up to 10 miles ahead of a thunderstorm have been documented. Sports coaches and officials must suspend play immediately!

Move to a sturdy building or car. Do not take shelter in small sheds, under isolated trees, or in convertible automobiles. Stay away from tall objects such as towers, fences, telephone poles, and power lines.

If lightning is occurring and a sturdy shelter is not available, get inside a hard top automobile and keep the windows up. Avoid touching any metal.

Utility lines and metal pipes can conduct electricity. Unplug appliances not necessary for obtaining weather information. Avoid using land line telephones or any electrical appliances. Use phones ONLY in an emergency.

Do not take a bath or shower during a thunderstorm.

Turn off air conditioners. Power surges from lightning can cause serious damage.

30/30 Lightning Safety Rule

Go indoors if, after seeing lightning, you cannot count to 30 before hearing thunder. Stay indoors for 30 minutes after hearing the last clap of thunder.

Outdoors and No Shelter?

Find a low spot away from trees, fences, and poles. Make sure the place you pick is not subject to flooding.

If you are in the woods, take shelter under the shorter trees.

If you feel your skin tingle or your hair stand on end, squat low to the ground on the balls of your feet. Place your hands over your ears and your head between your knees. Make yourself the smallest target possible and minimize your contact with the ground. DO NOT lie down.

If you are boating or swimming, get to land and find shelter immediately!

Jim Brewster, Meteorologist

Remember, if you can hear thunder - you are close enough to be struck by lightning!

Severe weather "Day in the Life" continued...

event, the NWS also issues Local Storm Reports (LSR). They are lists of severe weather and damage reported to the NWS office. The LSR is useful to emergency managers, the media, and adjacent NWS offices during the severe weather event.

Once the threat of severe weather ends, our job is not finished. We must notify the public when a watch is cancelled, cleared, or has expired. We also update the Hazardous Weather Outlook, letting everyone know they can "stand down." Next, we create a composite LSR including all reports received, during and after the event. We also field calls from the media about the event, and plan damage surveys, if there are reports of significant damage.

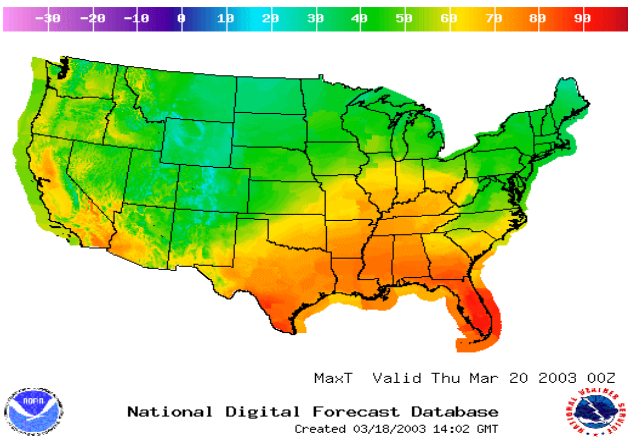
Severe weather events are a busy time at a NWS office, but protecting life and property is the most important mission of the NWS. We are proud of our ability to achieve that mission, and we are indebted to the SkyWarn spotters, emergency managers, and public safety officials, who provide us with the vital information to make our warnings better reflect reality.

Michael Cempa, Meteorologist

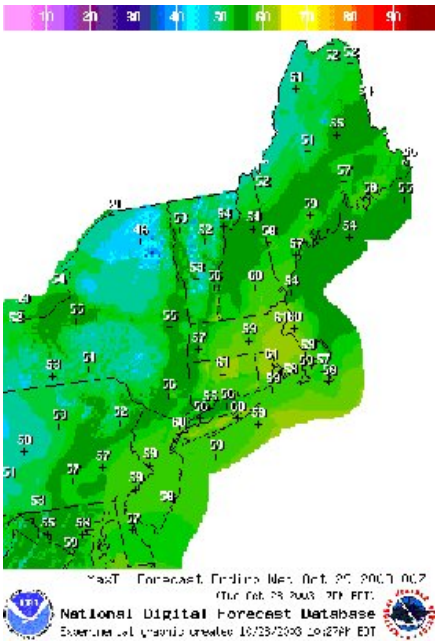
NWS Digital Forecast Database (NDFD): From National Forecasts, to Your Specific City

As of October 1, 2003 the National Weather Service (NWS) officially entered a new era: an era of providing digital and graphical forecast data for every part of the country. From the national level all the way down to the city or town that you live in, forecasts are available. The purpose of this article is to give you an overview of NDFD, which can be accessed from the Internet.

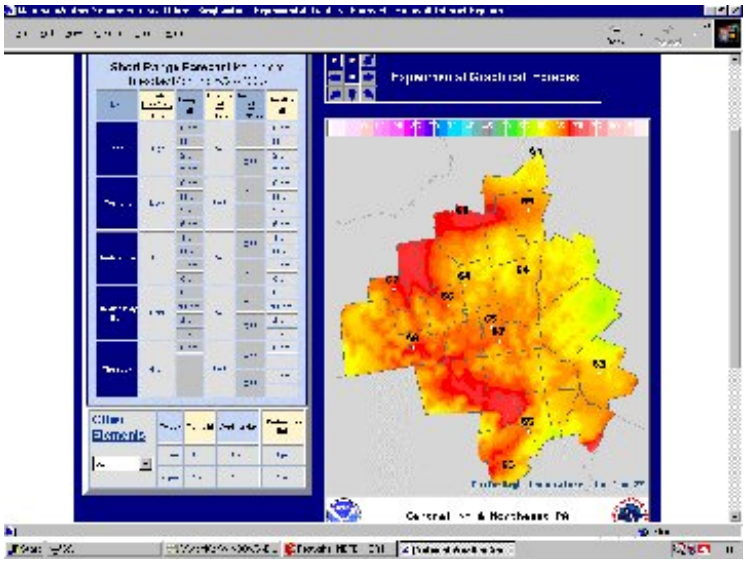
At the national level, there are forecast images available for the whole country, which include temperature, precipitation and probability of precipitation. To the lower left is an example of a maximum temperature forecast that appears when you click on the following web site: http://weather.gov/forecasts/graphical



You can also get more detailed forecast information for each part of the United States. For example, for more detail of the northeast United States, the user would just click on the northeast United States from the national map to the left and get a forecast graphic specific for the northeast U.S., as seen in this image to the right.



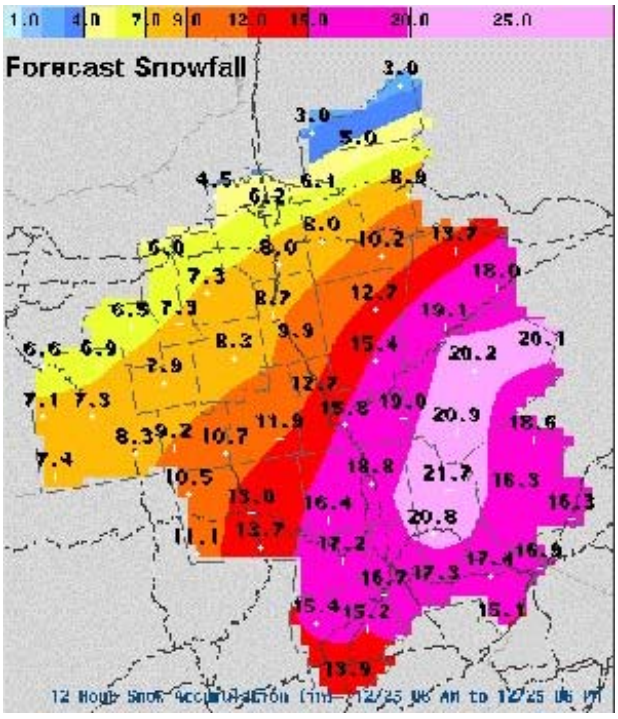
If you want even more local forecast information, click on the regional map, say northeast Pennsylvania, and you will see an image like this, which is a detailed forecast map of the Binghamton NWS's area of responsibility:



For even more detail, say for the town that you live in, experimental multi-formatted forecasts are now available from the NWS Binghamton web site which is http://weather.gov/er/bgm NWS Binghamton is one test site in the Eastern Region of the NWS for this experimental forecast. Therefore, these specific forecasts are only available in central NY and northeast Pennsylvania at the present time.

To access these forecasts, click on the approximate location where you live from the map that is on NWS Binghamton's front web page. These forecasts are highly detailed and will vary slightly from town to town, especially where terrain is prevalent. NWS Binghamton is experimenting with several ways of forecasting snowfall and temperature variation between our hills and valleys. We all know that, especially in winter, there could be profound differences in snowfall and temperature depending on elevation. These new experimental forecasts will try to capture the local variations and provide you, our valued customers, with the most accurate forecast possible for your specific location. Whether you live in the Poconos at 2000 feet elevation, or deep down in the Delaware or Wyoming Valleys at 500 feet elevation, we've got a forecast for YOU!

Snowfall forecast maps are also available from NWS Binghamton web site. The snowfall forecast maps will show you where our forecasters think the heaviest snow will occur in our region. The image below was the snowfall forecast for the Great Christmas Snowstorm of 2002 issued by our office.



In summary, there is now more forecast data available than ever before. Please send us your comments as we are continually adjusting and improving our forecast formats to better serve you, the customer! You can send me an email at david.nicosia@noaa.gov with your comments or suggestions.

David Nicosia,
Warning Coordination Meteorologist

Flash Floods: Our Area's Biggest Severe Weather Threat.

When people think of severe weather, the first thought that comes to mind is a large tornado sweeping across the country-side destroying houses, barns, and buildings, injuring and even killing people. Some may think of a thunderstorm with high winds, giant hail and frequent lightning. Others may envision a powerful hurricane making landfall with intense winds, storm surge and heavy rains. Indeed, hurricanes, tornados and lightning kill or injure many people annually in the United States. But it is the flash flood, which poses the greatest threat of all storm-related weather hazards. Flash floods kill more people on an annual basis in the United States that any other storm-related hazard by almost a 2 to 1 margin! Flash floods, as their name implies, happen suddenly and often take people by surprise. This is why they can be so deadly.

Upstate New York and Northeast Pennsylvania, with its beautiful hillsides and mountains, is one of the most flash flood prone regions in the Eastern United States. The steepness of the terrain combined with the extensive drainage system of small streams and creeks makes this region particularly vulnerable to flash floods. Flash floods can occur anytime of year in our region. Each year in central New York or northeast Pennsylvania at least a few areas suffer from a flash flood. The incredible thing about flash floods is that one area could be devastated by excessive rainfall in a few hours time span while another area 10 miles away sees only light rain.

Mudslide from Flash Flooding in Steuben County, NY July 22, 2003. Photo courtesy Mike Sprague, Steuben County Emergency Management.

Last summer, our area was hit particularly hard with flash floods. There were several flash floods that hit Steuben County, New York in July and August 2003 causing about 10 million dollars worth of damage. Fortunately, no one was hurt.

In Southport of the Elmira area, there was a major flash flood on August 11th causing 3 million dollars of damage. Again there were no injuries or deaths. Both White Haven and Jermyn, Pennsylvania suffered major flash flooding last summer which caused millions of dollars in property damage.

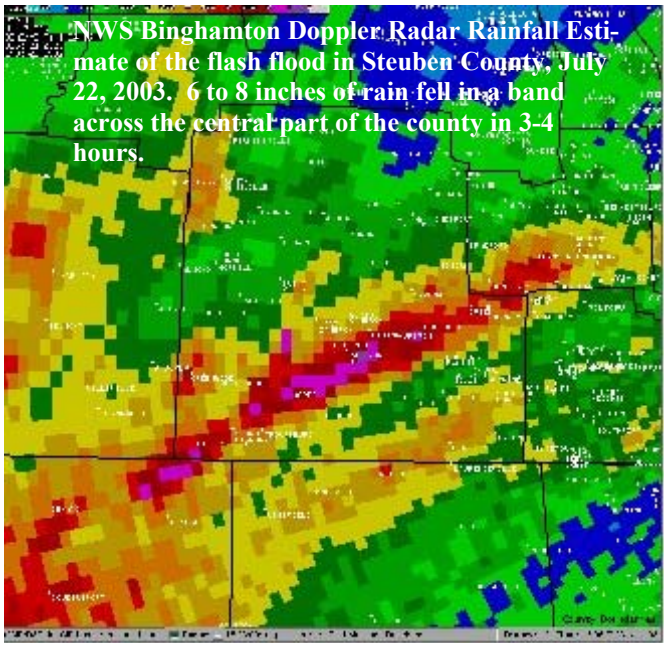
Unfortunately, there was a deadly flash flood that claimed 5 lives during the evening of June 13th 2003 in eastern Broome County. A car was driven into a flooded roadway and was swept into the raging waters of a flooded stream killing all those inside. In Delaware County, after a period of prolonged rains, two 10 month old twins were killed when the car they were traveling in was swept into the flooded West Branch of the Delaware River. All in all, 7 people were killed in central New York with tens of millions of dollars of damage done from flash floods last year. Last summer more people were killed by flash floods than the large tornado outbreaks that hit upstate New York and northeast Pennsylvania in 1998, or the Labor Day 110 mph wind

(Continued on page 15)

Flood Safety Rules:

- Monitor weather conditions and forecasts.
- Go to higher ground if flooding occurs!
- Heed flood warnings for your area.
- Avoid areas already flooded
- NEVER drive through flooded roadways.
- Abandon stranded vehicles and seek higher ground.
- Avoid camping near streams or

storm that hit the Syracuse area. Yet, the power of flash floods is still underestimated.



NWS Binghamton Doppler Radar Rainfall Estimate of the flash flood in Steuben County, July 22, 2003. 6 to 8 inches of rain fell in a band across the central part of the county in 3-4 hours.

The most common cause of flash flooding in summer is a slow-moving or stationary thunderstorm that dumps heavy rain relentlessly on a small, localized region. This is especially true in July and August when the jet stream is often very weak or north of our area. The jet stream is a current of air high up in our atmosphere, which "steers" weather systems along, including thunderstorms. When the jet stream is weak or well north of the region, thunderstorms that form often have very weak steering currents and move slowly, producing flash floods. The hills and mountains of our region often are the breeding grounds for these slow-moving thunderstorms. As winds rise up the mountains, the air cools and condenses forming clouds, and, when the conditions are right, the clouds can develop into thunderstorms. With weak steering currents aloft, these thunderstorms often remain stationary on a hill or mountainside. This often has disastrous consequences since many small streams and creeks flow down our mountains and hills.

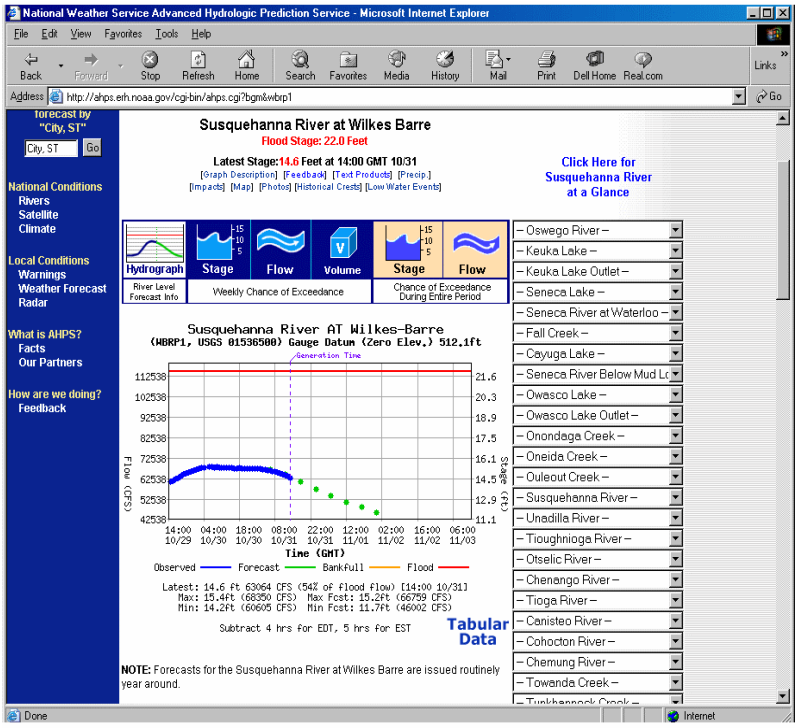
It is important to recognize the dangers of flash flooding and respect the power of water. Most people are killed in floods when they try to drive across a flooded roadway. Whether you are driving or walking, if you come to a flooded road, Turn Around Don't Drown! You will not know the depth of the water nor will you know the condition of the road under the water. The National Weather Service monitors the potential for flash flooding each day by using flash flood guidance which is a threshold of rainfall that is needed to produce flooding. National Weather Service Doppler Radar can estimate how much rain falls in a given area. National Weather Service Binghamton also maintains an extensive rain spotter network of volunteers who measure rainfall, and provide reports to our office. It is through Doppler radar and timely rainfall reports that our forecasters can assess the potential for flash flooding and issue flash flood warnings which means flash flooding is imminent, or occurring. When a warning is issued, you need to take quick action to protect you and your family if you are in a flood prone area. You should not drive in flood prone areas if a warning is in effect. In addition, the National Weather Service will issue a flash flood watch when conditions are favorable for flash flooding to occur. Flash flooding is a possibility in the watch area, not a certainty. When a watch is in effect keep a close eye on the weather and avoid driving around flood prone areas if heavy rain is occurring.

Not to diminish the danger of hurricanes, tornados, thunderstorm winds and hail, but this summer, let's not forget that flash floods are severe weather too, and our area, in particular, is very vulnerable.

David Nicosia, Warning Coordination Meteorologist
Warning Coordination Meteorologist

Remember: "TURN AROUND, DON'T DROWN"

Rivers....continued from page 3

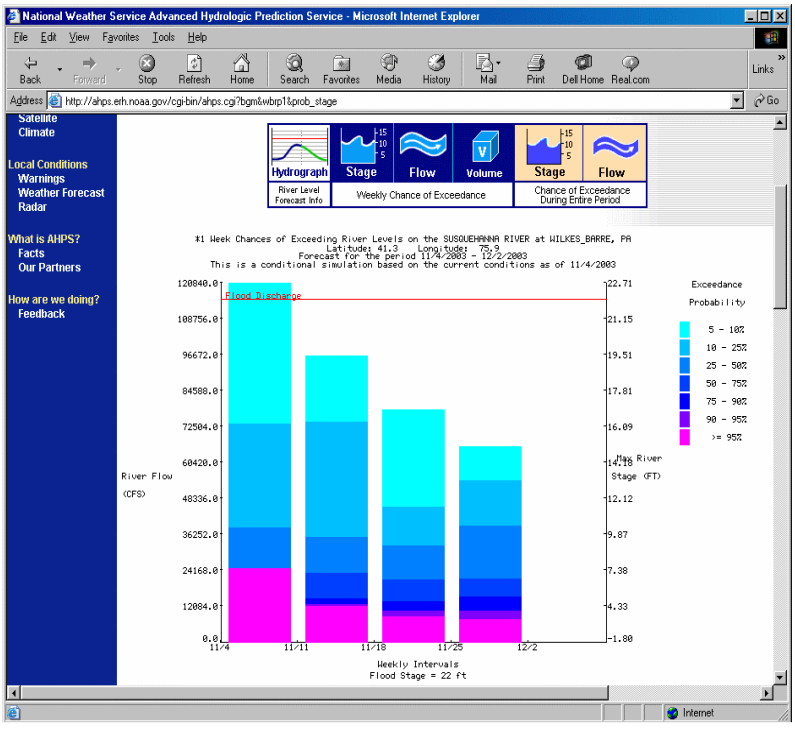


Hydrograph page. The hydrograph image to the left shows that the Susquehanna recently crested just below 16 feet and is expected to continue to fall.

Across the top of the hydrograph page is a tool bar with 5 boxes to choose from to view the 30-day probabilistic forecasts. For example, the "Weekly Chance of Exceedance – Stage" box will bring up a graphic similar to the one below. This graph divides the next 30 days into 4 weekly periods and displays the potential for reaching various river levels by week. Similar graphics are also available on the tool bar for weekly analysis of flow and volume.

User feedback to date suggests that the two boxes on the right that show the chance of exceedance for the entire 30-day period are perhaps the most useful. The graph on page 17 is an exceedance probability graph showing the potential for flooding during the next 30 days is above normal in comparison to what has been historically observed, as the CS curve (based on current conditions) is above and to the left of the HS curve.

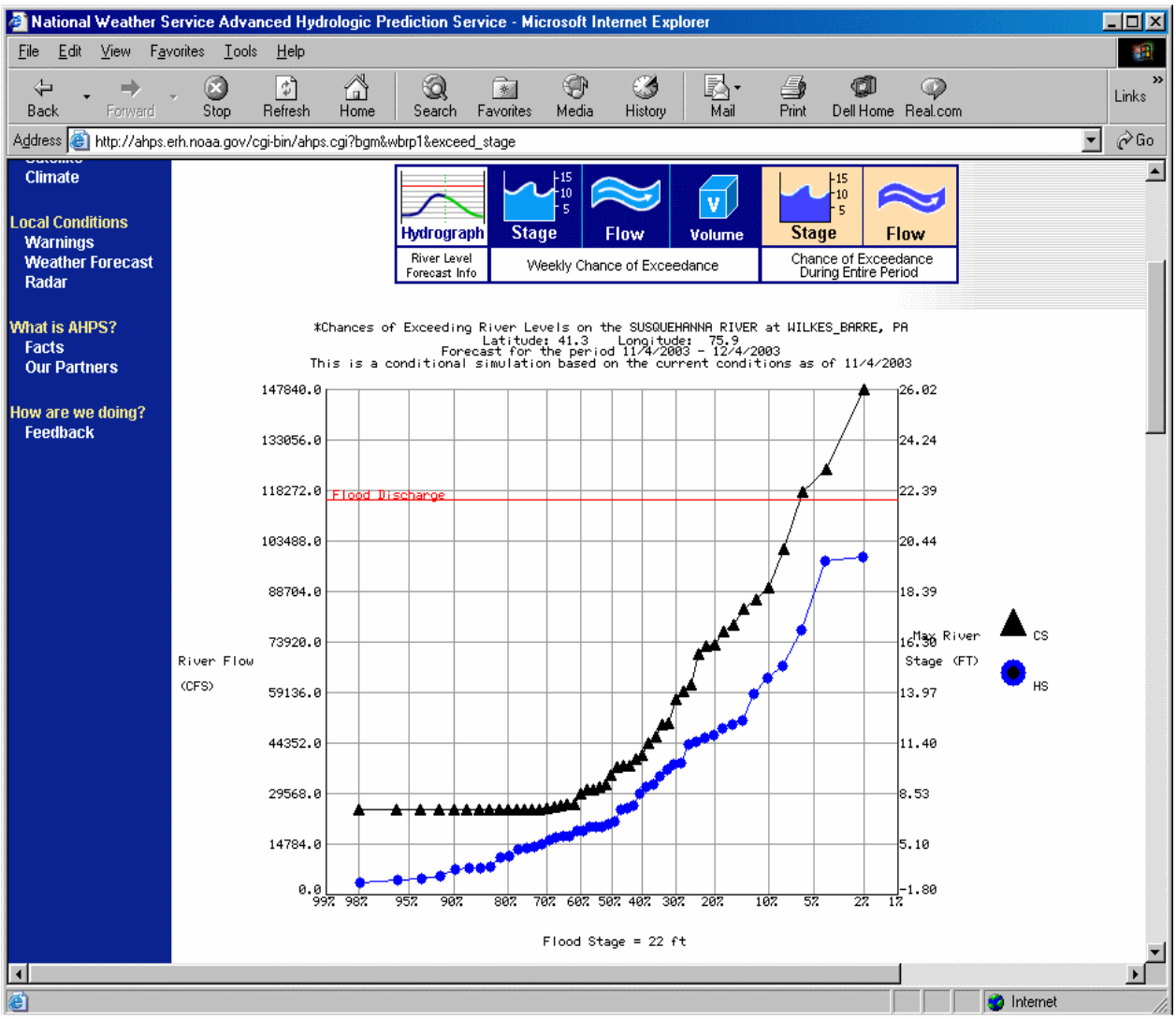
The type of analysis in the graphic on page 17 is particularly useful when the NWS prepares Spring Flood Potential Outlooks which summarize the potential for flooding over an upcoming two week period. This AHPS probabilistic technique is well suited for generating a quantitative assessment of how the current basin conditions (soil moisture, river levels, snow pack conditions) impact the potential for future flooding. NWS also generates 30-day inflow forecasts for numerous reservoirs in the Susquehanna and Delaware Basins.



These forecasts are viewable by clicking on the reservoir of interest on the main AHPS page and clicking the right-hand most box in the tool bar to display the "Chance of Exceedance" graphic. Other types of AHPS products are being developed and demonstrated in the Central Pennsylvania portion of the Susquehanna Basin including short-term (7-day) probabilistic river forecasts and flood inundation mapping. It is envisioned that similar types of AHPS products will be available for the BGM hydrologic service area in the future.

Successful deployment of the AHPS program requires the input and cooperation of other agencies in addition to the NWS including the U.S. Geological Survey, the U.S. Army Corps of Engineers, the Susquehanna River Basin Commission and numerous State and Local Agencies that help with data collection and dissemination.

Ned Pryor, Hydrologist
Middle Atlantic River Forecast Center



Mailing Address Line 1
Mailing Address Line 2
Mailing Address Line 3
Mailing Address Line 4
Mailing Address Line 5

NATIONAL WEATHER SERVICE, BINGHAMTON, NY

Binghamton Regional Airport
32 Dawes Drive
Johnson City, NY 13790

www.nws.noaa.gov/er/bgm

Associate Editor: James A. Brewster

Comments concerning this publication or questions about the National Weather Service can be directed to:

National Weather Service
Binghamton Regional Airport
32 Dawes Drive
Johnson City, NY 13790

Phone: (607)770-9531 x 223
Fax:(607)798-6624
E-mail: david.nicosia@noaa.gov

Home Page on the internet:
http://weather.gov/er/bgm

You can monitor the latest weather conditions around the area, as well as our forecasts on:

NOAA Weather Radio Operating on the following transmitters:

Binghamton	WXL38	162.475
Syracuse	WXL31	162.550
Scranton	WXL43	162.550
Elmira	WXM31	162.400
Cooperstown	WWH35	162.450
Walton	WWH34	162.425
Stamford	WWF43	162.400
Norwich	KHC49	162.525
Ithaca	WXN-59	162.500
Towanda	WXM95	162.550
Mt. Washington	WXN55	162.450
Call Hill	WXN29	162.425

This newsletter is published for Skywarn Spotters, schools, emergency managers, media, and other interested parties in the county area served by the National Weather Service in Binghamton, NY.

This publication, as well as our forecast products and a host of other weather information, are available on our internet page.